over. One large hospital has very recently adopted the plan of having the linen ordered daily by the head nurses directly from the laundry. A requisition is sent in every day, all surplus linen going to a central supply-room, whence it may be procured in emergencies. This system means placing a value on the clean-linen supply, and at once, it is said, reduced the amount sent to the laundry by one quarter. This perhaps would not have so much influence on the use of linen in operating-rooms, for there it will probably remain to a large extent a matter under the control of the visiting surgeons in common with other surgical supplies.

It is of course a poor economy which fails to provide enough good suitable material and appliances for whatever work is necessary, but the tendency at this moment is not in that direction. It is rather toward the restriction of the usefulness of the entire institution, by lack of proper control, of one of its most costly departments, and constant vigilance in the handling of its smallest detail. Measures which are necessary in the successful conducting of any ordinary business cannot be ignored in the great business of carrying on the work of large charitable institutions.

ECONOMY IN SURGICAL TECHNIQUE

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Economy in the use of materials, as also of labor and time in surgical work, is to so great an extent dependent on the technique employed that we cannot consider one without the other. It is an important subject to us as administrators of hospital funds and instructors of nurses, to take into consideration this ever-increasing elaboration of detail in surgical technique, involving greater expenditure of material and possibility of waste, and by our combined efforts with the knowledge we can derive from our many hospitals, evolve a scheme of work that shall combine principals of good technique with simplicity of method.

We might ask ourselves the following questions:

1. What is the purpose and necessity of surgical technique?
2. What are the minimum requirements for aseptic technique?
3. Are the results as good with a simple method as with an elaborate and complicated system?

4. Is economy in the use of surgical supplies compatible with good technique?

The purpose of every surgical operation is, primarily, to save and prolong life comfortably. Secondly, to secure good results by an effective system of aseptic technique. Do the requirements of this system mean something elaborate and complicated, involving many assistants, large and expensively furnished operating-rooms, a lavish abundance of linen, sterilized supplies, instruments, solutions, and the many, many details which we all know so well, making possible great expenditure in money, time, energy, and waste?

It is difficult to define the exact requirements of good technique. What to one surgeon would be all-sufficient to render the proceeding aseptic, to another would be quite inadequate. The surgeon who requires twenty-four towels in performing a minor operation, would probably scorn the technique of the one who requires but six in an abdominal section. In one operating-room we find the field of operation has been scrubbed, poulticed and soaked with solutions for many hours before reaching the operating table; in another the skin is not touched until the anæsthetic is started, consequently the minimum requirements of good technique may mean in one case a system calling for an abundant use of material, and in another a simple method of work with small requirements. The results alone will answer for the system.

Has it been demonstrated that good results are compatible with economical technique? It has. In an important operating-room, when the chief efforts in the matter of technique are directed toward simplifying the methods, and at the same time secure good results, 3,836 operations were performed last year; of these, 2,157 were intraperitoneal, of which the total death rate was 2.1 per cent. Primary healing was generally obtained.

In this operating-room the chances for infection are reduced by minimum requirements in the number of assistants at an operation; in the handling of instruments and dressings, in the amount of space through which instruments, dressings, basins, etc., are carried. There is no preparation of the skin until the anæsthetic is started on the operating-table, with the exception of shaving, which is done in the ward. The field of operation is thoroughly cleaned with soap and sterile water, using a piece of sterile gauze rinsed well with sterile water, after which follows a light sponging with Harrington's solution. Four sterile towels are then placed in position surrounding the area of operation. This preparation takes about five minutes, and is done while anæsthesia is progressing, and the surgeon changing his sleeves and gloves. The dressing covering the wound in abdominal cases consists of a strip of gauze, a square of absorbent cotton, and one of common cotton, held in place with strips of adhesive plaster. Over this is adjusted a bandage made of gauze five yards long, folded the lengthwise of the gauze, four thicknesses. This is put on as a double spica of the groin and makes a most effective and comfortable bandage. When removed in the ward it is sent to the laundry and returned to the ward for further use. The number of towels used in each abdominal operation is from six to eight on the patient. The operator and his two assistants each wear one pinned to the apron in front, the surgeons' and nurses' gowns are as a rule not changed, during the morning's work, unless when badly soiled; fresh sterile sleeves and gloves are put on for each operation, also a fresh towel in front of the apron. Take for example the average morning's work, which consists of: 4 appendectomies, 1 abdominal hysterectomy for fibroids, 2 exophthalmic goitre, 1 amputation of breast for carcinoma, 1 gall-bladder cholecystectomy, 1 resection of stomach, and 4 minor operations.

The linen was counted when it reached the laundry. There were 144 towels, 8 aprons, 24 pairs of sleeves, 3 sheets, 41 square sponges. There were used for the morning's work nine pairs of gloves. The square sponges enumerated are used for sponging and packing in the abdominal cavity, and are made six inches square and of eight thicknesses, stitched securely; a piece of tape eight inches is stitched to the corner. These are sent to the laundry each day, soaked and boiled in a soda solution, then returned to the operating-room for resterilization, and used in the same capacity over and over again, until worn out. The small gauze sponges are also washed, resterilized, and sent to the wards for use there. Gloves are mended after each day's work. The adoption of a central supply-room in the hospital, which issues by daily requisition from the wards all the sterilized and unsterilized supplies, gauze, cotton, gutta-percha tissue, medicated gauze, etc., is a most effective check on extravagance in the use of surgical supplies. In one hospital 50 per cent. was saved after this method was started. Here the young pupil may be taught the principles and practices of economy in making the required dressings, also the cost of materials employed. She may also acquire a knowledge of the necessary amount to be sent, as the unused supplies can be returned each day to the supply-room for resterilization. The washed gauze from the laundry is also sent here and made up into dressings. Economy of technique may also be carried out in the method of surgical dressings. I have seen the paraphernalia of a surgical dressing consist of a tray, having two sterile enamel cups, one containing carbolic acid, 5 per cent.; the other alcohol 95 per cent.; a package of sterile dressings consisting of two towels, two pieces of newspaper, a square of common cotton, and one of absorbent cotton, and two strips of gauze folded six by two inches; the instruments, two pairs of forceps, one pair of scissors, are boiled and put in the cup containing the carbolic acid. One piece of paper is used to receive the soiled dressing to be burned, the other for the bandage to be sent to the laundry. Both are rolled up snugly before leaving the bedside and then put in their respective baskets in the lavatory. All the dressings are handled with sterile forceps, the dresser previously washing his hands thoroughly in running water. Yet the results of this Spartan simplicity are the best and well known in the surgical world. To what extent we should exceed these bare necessities, which combine economy and good technique, also to what extent the anæsthetic element should enter into our work, is for us to decide and determine. The practical details must be worked out in each hospital.

When all is summed up, we still have the personal equation to deal with,—the demands of the surgeon and his assistants when the nurse is utterly powerless to act, the tendency to extravagance so often shown by our nurses and fostered by their surroundings of costly equipment, unlimited supply of linen, and material for surgical work. Surely the nurse more often falls into the habit of extravagant use and abuse of material, not wilfully, but unintelligently, so great is the power of example.

Could we consider simplicity of method with good technique it would go far to solve this problem of extravagance and help to institute a régime of economy amongst our physicians and nurses.

I think a great many agreed with Miss Davis last year at the superintendents' meeting when she said the nurse should not bear all the burden for extravagance. It is the established system which she finds in use when she enters the hospital, and takes it as a matter of course.

In a paper by Dr. A. J. Ochsner, of Chicago, read before the American Surgical Association in 1904, he says: "Surgery is more and more coming to be a very reasonable, logical profession, and in developing a system of aseptic practice, one can count with much greater certainty upon the probability that everyone concerned will carry out the details, if he is expected to do things which would appeal to a sensible person, than if he is expected to go through an unreasonable routine performance."